

What is claimed:

1. A lithium secondary battery comprising a positive active material including a lithium transition metal compound, said compound being represented by the formula $\text{Li}(\text{Ni}_{x1}\text{Ti}_{x2})_z\text{Mn}_{2-z}\text{O}_4$ wherein z is 0.01 to 0.5, $x1+x2=1$, and said positive active material has a spinel configuration of the cubic system.
2. A lithium secondary battery comprising a positive active material including a lithium transition metal compound, said compound being represented by the formula $\text{Li}(\text{M1}_{x1}\text{M2}_{x2})_z\text{Mn}_{2-z}\text{O}_4$ wherein M1 and M2 are combinations of at least two different substitution elements, an average valence of M1 and M2 is +3, z is 0.01 to 0.5, $x1+x2=1$, and said positive active material has a spinel configuration of the cubic system.
3. A lithium secondary battery comprising a positive active material including a lithium transition metal compound, said compound being represented by the formula $\text{Li}(\text{M1}_{x1}\text{M2}_{x2})_z\text{Mn}_{2-z}\text{O}_4$ wherein M1 and M2 are combinations of at least two different substitution elements, an average ionic radius of the substitution elements is within ± 15 percent of the ionic radius of Mn having +3 valence, z is 0.01 to 0.5, $x1+x2=1$, and said positive active material has a spinel configuration of the cubic system.

4. A lithium secondary battery, comprising:
 a positive active material comprising a lithium transition metal compound, said compound being represented by the formula $\text{LiM}_Z\text{Co}_{X-Z}\text{O}_Y$, wherein M is at least two different substitution members, at least one of the substitution members is a +2 valence metal of Ni, and another one of the substitution members is Ti, and Z represents a quantity of substitution and satisfies the formula $0.005 \leq Z \leq 0.3$, X is about 1, and Y is about 2.

5. A lithium secondary battery according to Claim 4, wherein said lithium transition metal compound further comprises Li as an additional element.

6. A lithium secondary battery according to Claim 5, wherein said lithium transition metal compound further comprises Mg as an additional element.

7. A lithium secondary battery according to Claim 4, wherein said lithium transition metal compound is selected from the group consisting of

$\text{LiNi}_{0.0025}\text{Ti}_{0.0025}\text{Co}_{0.955}\text{O}_2$, $\text{LiNi}_{0.025}\text{Ti}_{0.025}\text{Co}_{0.95}\text{O}_2$, $\text{LiNi}_{0.125}\text{Ti}_{0.125}\text{Co}_{0.75}\text{O}_2$, and

$\text{LiNi}_{0.15}\text{Ti}_{0.15}\text{Co}_{0.7}\text{O}_2$.

8. The lithium secondary battery of claim 4, wherein the average ionic radius of the substitution members is within ± 15 percent of the ionic radius of Co.

9. The lithium secondary battery according to claim 4, wherein the lithium transition metal compound is composed by firing a mixed compound comprising salts and/or oxides having been prepared with a predetermined ratio in the presence of oxygen within a temperature range of 600°C to 1000°C for 5 hours to 50 hours.

10. The lithium secondary battery according to claim 9, wherein the lithium transition metal compound has been synthesized and obtained by conducting at least first and second firing steps, with the firing temperature of the second step being higher than that of the first step.